



FEATURES

$R_{DS(on)}$ typ. $1.3\ \Omega$ @ $V_{GS}=10V$
Fast Switching Capability
Avalanche Energy Specified
Improved dv/dt Capability, High Ruggedness

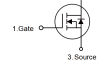
APPLICATIONS

High frequency switching mode power supply
Electronic ballast
LED power supply

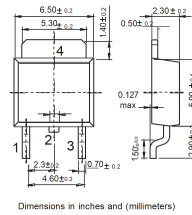
PRODUCT CHARACTERISTICS

PARAMETER	TEST CONDITIONS	UNIT
V_{DS}	50V	
$R_{DS(on)}$ typ. ($V_{GS}=10V$)		$1.3\ \Omega$
Q_g typ.	24nC	
I_D	5A	

TO-252



TO-252
Unit: mm



ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current	I_D	5	A
Drain Current (Pulsed)	I_{DM}	20	A
Avalanche Current (Note 2)	I_{AS}	5	A
Avalanche Energy	E_{AS}	300	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	125	V/ns
Power Dissipation	P_D	125	W
Junction Temperature	T_J	$+150$	$^\circ\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

Note: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. $L = 21\text{mH}$, $I_{AS} = 5A$, $V_{DS} = 50V$, $R_{\theta JA} = 250$, Starting $T_J = 25^\circ\text{C}$
4. $I_{AS} \leq 5A$, $di/dt \leq 200A/\mu s$, $V_{DS} \leq BV_{DS}$, Starting $T_J = 25^\circ\text{C}$

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ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

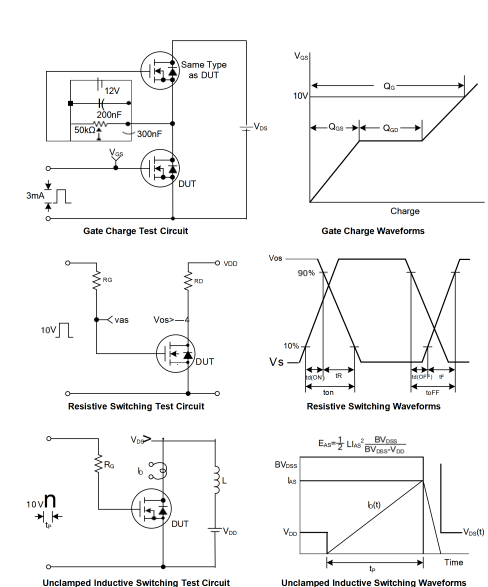
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DS}	$I_D=250\mu A$, $V_{GS}=0V$	500			V
Breakdown Voltage Temperature Coefficient	$\pm BV_{DS}/\Delta T$	Reference to 25°C , $I_D=250\mu A$		0.5		$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{SS}	$V_{GS}=500V$, $V_{DS}=0V$			1	μA
Gate-Source Leakage Current	I_{GS}	$V_{GS}=30V$, $V_{DS}=0V$			100	nA
Gate-Source Leakage Current (Reverse)	I_{GS}	$V_{GS}=-30V$, $V_{DS}=0V$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V$, $I_D=2.5A$	1.3	1.55		Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{iss}	$V_{DS}=0V$, $V_{GS}=25V$		480	625	pF
Output Capacitance	C_{oss}	$f=1.0\text{MHz}$		80	105	pF
Reverse Transfer Capacitance	C_{rss}	$f=1.0\text{MHz}$		15	20	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_g	$V_{GS}=10V$, $V_{DS}=400V$, $I_D=5A$ (Note 1, 2)		18	24	nC
Gate to Source Charge	Q_{gs}			2.2		nC
Gate to Drain Charge	Q_{gd}			9.7		nC
Turn-ON Delay Time	t_{ON}			12	35	ns
Rise Time	t_r	$V_{DS}=250V$, $I_D=5A$		46	100	ns
Turn-OFF Delay Time	t_{OFF}	$R_{\theta JA}=250$ (Note 1, 2)		50	110	ns
Fall Time	t_f			48	105	ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				5	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				20	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=5A$, $V_{GS}=0V$			1.4	V
Reverse Recovery Time	t_{rr}	$I_S=5A$, $V_{GS}=0V$			83	ns
Reverse Recovery Charge	Q_{rr}	$dI/dt=100A/\mu s$ (Note 1)			0.25	μC

Note: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
2. Essentially independent of operating temperature

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RATING AND CHARACTERISTIC CURVES (5N50)



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